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Evidence and simplicity: why we should reject homeopathy

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Abstract

Homeopathic medications are used by millions, and hundreds of millions of dollars are spent on these remedies in the USA alone. In the UK, the NHS covers homeopathic treatments. Nonetheless, homeopathy is held in considerable disrepute by much of the medical and scientific community. Many proponents of homeopathy are well aware of these criticisms but remain unimpressed. The differences of opinion run deep, and the debate seems deadlocked. We aim to shed some light on this situation. We briefly recap some of the major arguments on each side, but we try to go further by making explicit an underlying philosophical presupposition. In particular, we will claim that there is an important principle, which has ancient roots going back at least to Occam, some version of which constrains all empirical reasoning. We call this constraint the simplicity principle. We argue that this is not something specific to a scientific paradigm, but that, all of us, including proponents of homeopathy, are themselves deeply committed to the simplicity principle. However, once the simplicity principle is made explicit and applied to homeopathy, allegiance to homeopathy is clearly seen as irrational. The point is not merely the lack of clinical trials supporting homeopathy; rather, belief in the efficacy of homeopathy leaves a mountain of unexplained mysteries, and thereby flies in the face of the simplicity rule that guides the homeopaths' own reasoning and arguments. If nothing else, we hope that defenders of homeopathy will gain a greater understanding of why critics are so deeply reluctant to accept the efficacy of homeopathic interventions – and that this reluctance is not mere stubbornness or artificial allegiance to western medicine. Finally, we also hope thereby to illustrate the usefulness of philosophy in unearthing presuppositions in seemingly deadlocked debates.

Introduction

Homeopathy is intensely controversial. While millions of consumers and practitioners subscribe to it [1,2], homeopathy is held in considerable disrepute by much of the mainstream medical and scientific community. The differences of opinion run deep; each side is inclined to think that the other is close-minded, irrational, or both [3–5].

As with any medical intervention, there are two sorts of questions one can ask about homeopathy, one fairly theoretical and one more empirical:

A Is there a plausible theory that explains how homeopathy *could* work? Is it the sort of intervention that we would *expect* to be effective, given what we know about the world?

B Is there empirical evidence that homeopathy is effective?

Critics of homeopathy have alleged that the answers to both questions are negative. Regarding (B), there is, at best, patchy and low-quality evidence for the effectiveness of homeopathy. And regarding (A), critics say that we have no idea how homeopathy could possibly work, and that it doesn't seem to make sense at all given our current theories of chemistry and physiology. Critics argue that we should reject homeopathy because of this situation.

Defenders of homeopathy can take one of the three lines of reply. First, they might claim that we do have an explanation (or at least the beginning of an explanation) for how homeopathy can be effective. Second, some homeopaths deny that we *need* a theory to explain how homeopathy works, for they think that the evidence of its effectiveness is so strong that it is only blind stubbornness to deny it. Third, they might deny the need for a scientific explanation on the grounds that homeopathy is a different paradigm and cannot be judged by the standards of western science.

We aim to shed some light on this debate by making explicit a philosophical principle that constrains both common sense and scientific reasoning. This constraint, which we will call the simplicity principle, has ancient roots that go back at least to Ockham. In light of the simplicity principle, we will be able to see more

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clearly how questions (A) and (B) relate to each other and, in particular, why each of the three homeopathic lines of reply is inadequate. If nothing else, we hope that defenders of homeopathy will gain a greater understanding of why many within the medical and scientific community are so deeply reluctant to accept the efficacy of homeopathic interventions and why this reluctance is not mere blind stubbornness or some sort of artificial allegiance to a parochially western concept of medicine.

The paper is structured as follows. Following the introductory questions, in section 2, we introduce and explain the simplicity principle. In section 3, we explore question (A). We explain, from the vantage point of the simplicity principle, why it seems so implausible that homeopathy could be effective. In section 4, we look at the first line of reply from homeopathy, namely their efforts to show that they *do* have a plausible explanatory theory for homeopathy. In section 5, we explore their second line of reply, the claim that they need no answer to question (A) because the clinical evidence of effectiveness is so strong. In section 6, we investigate the third line of reply, according to which there is no need for a scientific explanation of homeopathy because homeopathy is somehow beyond the realm of what can be judged by modern science. We conclude in section 7.

The simplicity principle (S)

William of Ockham famously proposed that *entia non sunt multiplicanda praeter necessitatem* – that is, entities ought not to be multiplied beyond necessity [6]. We propose that a somewhat more general version of Ockham's principle underlies much of scientific and common sense reasoning:

(S) Given two theories, it is unreasonable to believe the one that leaves significantly more unexplained mysteries.

The idea behind the principle is meant to be fairly basic: We prefer theories that have greater explanatory power. Given two theories, *X* and *Y*, if *X* explains some fact whereas *Y* leaves that fact as an unexplained brute mystery or coincidence, then, all other things being equal, we tend to reject *Y*. For example, in Aristotelian physics, there are three separate phenomena each of which is left essentially unexplained: that ordinary objects fall towards the earth; that there are oceanic tides, and that the planets orbit the sun. Newton proposed a universal gravitational force that varies with the mass of the objects and varies inversely with the square of the distance between them. With this supposition, Newtonian mechanics gives us a unified explanation of objects falling, the tides, and planetary orbits. Newton famously had no further explanation for *why* the gravitational force works as it does; this was left as an unexplained mystery. However, by positing this one mystery, Newton was able to explain a number of apparently disparate phenomena, each of which had necessarily been left as unexplained mysteries by Aristotelian physics. This increase in explanatory power is a strong reason for rejecting Aristotelian theory.

The case for (S) goes beyond examples of purely scientific practice. In fact, it is our commitment to the simplicity principle, or something very like it, that keeps us from believing all manner of absurd things. Consider a theory introduced by Bertrand Russell [7]: the world is but 5 minutes old. Of course, we seem to remember many events that happened longer ago than that, and books are full of accounts of more distant times, but, according to the 5-minute theory, our memories and those books simply popped into existence 5 minutes ago. According to standard physics, the sunlight we see left the sun about 8 minutes ago. The 5-minute theory accepts the same laws of nature, but says instead that the photons came into existence 5 minutes ago part of the way between the sun and the earth.

Of course the 5-minute theory is patently absurd, and no rational person would take it seriously. But why not, exactly? As the 5-minute theory postulates the same laws of nature, the 5-minute theory is also just as successful at prediction as the standard picture. So, in terms of empirical adequacy, the 5-minute theory and the standard picture are on par.

What differentiates the 5-minute theory and the standard picture is simplicity. The standard picture does have its share of unanswered questions, for example, 'why is there a universe at all?', 'why is the mass of the neutron 1.293 MeV heavier than that of the proton, rather than, say, 1.287 MeV?', etc. As current physics leaves these questions unanswered, they count as unexplained mysteries for the standard theory. The 5-minute theory naturally has those mysteries as well, as it adds no explanatory power to the standard picture. However, the 5-minute theory also adds innumerable other mysteries. Here are just a few:

- Why is it that our memories and the history books are in remarkable agreement about things that 'happened' long before 5 minutes ago?
- Why are there are huge numbers of things that bear an incredible resemblance to each other – multiple copies of books, animals of the same species, cars of the same make, etc.?
- Why is it that there are houses that work so well for people to live in? Why roads that work so well for cars to drive on?

Indefinitely many other questions could be added. The 5-minute theory has no answers to these questions; it must leave the facts referred to as unexplained, brute mysteries. By contrast, of course, the standard picture has easy simple and mundane answers to these questions.

The point is simply this: the 5-minute theory is a remarkably bad theory not because of any empirical inadequacy, but because it posits so many unexplained mysteries – because it leaves so many questions unanswered that can be answered by an alternative theory. The 5-minute theory fails badly on simplicity grounds, as judged by (S), and *it is for this reason* that nobody takes the theory seriously. In other words, it is only because of our commitment to principle (S), or something very much like it, that we can reject the 5-minute theory; everyone rejects the 5-minute theory; therefore, everyone is committed to the truth of (S), or something very much like it.

Admittedly, as formulated (S) is somewhat vague: it is not clear exactly how one counts unexplained mysteries, so it won't always be clear which of two theories leaves more mysteries. Moreover, some questions seem to cry out for explanation more than others, and it is perhaps more serious for a theory to leave such questions unanswered. As we have no algorithm for determining the importance of mysteries or for counting them, we have no algorithm for applying (S) mechanically to alternative theories. In the simplest cases, one theory will have all of the same mysteries as the alternative, plus a great many more. However, even in more complex cases, the principle of simplicity can point fairly clearly and strongly in one direction.

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Homeopathy and the plausibility question

Samuel Hahnemann invented homeopathy in the late 18th century. His basic idea was this: if a substance in large doses causes symptoms of a certain sort, then diluted doses of the substance will be effective in relieving those symptoms. This principle is referred to as the 'law of similars' [8]. The dilutions that Hahnemann and current homeopaths employ for treatment are extreme. An alcohol tincture of the original substance is diluted either 1:10 or 1:100 in water and is then shaken vigorously. The resulting solution is then diluted again, and shaken, or succussed, again, and so on. Typical homeopathic remedies have dilution rates ranging from a low of one part active ingredient per 1 million parts water, to mind-boggling 1 part cure per 10^{2000} parts water [9]. For dilutions that are one part in 10^{24} or greater, it is statistically unlikely that even a single molecule of the original substance remains – this result follows from simple statistical calculations based on atomic weights and Avogadro's number, and proponents of homeopathy are well aware of it. So these homeopathic remedies are, to the best of our current knowledge, chemically indistinguishable from the water in which they are diluted, and the 'different' homeopathic remedies are chemically indistinguishable from each other.

Homeopathic theory, on its face, has some rather large unexplained mysteries that are not faced by proponents of conventional science and medicine. Here are a few having to do with dilution:
(1) How can something chemically indistinguishable from water have dramatic curative effects?
(2) How can two homeopathic remedies that are chemically indistinguishable from each other have *different* effects?
(3) With all other medications, if you dramatically reduce the concentration of the solution, the effects diminish to zero. Why is it that the homeopathically produced compounds work differently? Why don't other drugs dramatically increase in potency when diluted in such extreme fashion?
(4) All samples of water will have trace amounts of impurities both natural and artificial. If infinitesimally dilute amounts of homeopathic drugs can have dramatic powers, why don't we see anything of the sort with other water samples? Or, to put it more specifically, homeopathic solutions themselves will have trace impurities beyond those of the supposedly active ingredient. How does the solution 'know' which impurities are supposed to give it therapeutic powers?

The law of similars is another curious aspect of homeopathy, for it claims that substances which in macroscopic doses cause a certain set of symptoms will relieve that set of symptoms when taken in infinitesimally small doses. This is unlike any other known medicinal substance. So:
(5) Why does the law of similars apply to homeopathic ingredients when it has never been seen to apply to any other medicinally used substance?
Homeopaths sometimes make an analogy here to vaccines, for in both cases, a substance, which in large doses would cause illness, has a positive medicinal effect in the right form and in small doses. But the analogy is not, in the end, very apt; if we were to accept the analogy, further questions would arise:
(6) If vaccines are diluted to the point where nothing remains of the active ingredient, they become ineffective. Why are homeopathic remedies different?
(7) Why is it that vaccines only have preventative power, but homeopathic remedies have curative power? Why don't vaccines have curative power?
It is worth emphasizing that these questions are not mere matters of detail. If the homeopaths simply leave these questions unanswered, then they would be admitting that their theory leaves gaping unexplained mysteries not faced by the allopathic alternative. In accord with the simplicity principle, this would be strong reason to reject homeopathy.

First homeopathic reply: explanations for homeopathy

Some committed homeopaths acknowledge that they have no explanatory theory, admitting that 'there is a need for viable hypotheses of homeopathy mechanism of action' [10], 'we don't know how or why homeopathy works' [11], 'more than 200 years after Hahnemann, the homeopathic mechanism is as unknown as it was in the beginning' [12]. On the other hand, some proponents of homeopathy claim that they do have answers, or at least the beginnings of answers, to those questions. Some of the proffered theories are very general. For example, some say that when people are ill, their bodies become hypersensitive to homeopathic preparations [9]. This observation might be thought to have some value in answering a number of the questions above, but, in reality, it just pushes the questions back a step: *Why* do ill bodies become hypersensitive to dilute versions of these substances but to no others? Why aren't healthy bodies hypersensitive to infinitesimally small amounts of these or other ingredients? How can a body be so sensitive to a substance that it reacts even when there are no molecules of the substance left? Without answers to these questions, talk of hypersensitivity is mere handwaving.

When homeopaths make a more serious effort to answer questions like those raised above, they offer two sorts of approaches. First, following Hahnemann himself, proponents sometimes claim that homeopathic medications cure by affecting something in the human person that goes beyond what science can quantify or explain. This special feature of persons is sometimes referred to as 'vital force', and it is given various different descriptions by homeopaths:

> life energy itself . . . difficult to quantify, but it is the very real difference that occurs between life and death. [9]
>
> the spiritlike dynamism that flows through the material organism. [13]
>
> the inherent, underlying, interconnective, self-healing process of the organism. This bio-energetic force is similar to what the Chinese call 'chi,' Japanese call 'ki,' yogis call 'prana,' Russian scientists call 'bioplasm,' and Star Wars characters call 'The Force'. [8]

However, if such talk is meant to give us answers to the questions above, then it fails. We would need to know *why* homeopathic remedies affect our 'vital force' in ways that other infinitesimally diluted solutions do not, etc. Moreover, merely positing a 'vital force' generates substantial mysteries, for homeopathy thereby looks to be committing itself to a view of the mind that philosophers call *substance dualism*. Space does not allow us to go into a detailed discussion of substance dualist views, but we can say that substance dualism is almost universally rejected by

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those who have thought most about it, namely philosophers of mind. Moreover, philosophers reject substance dualism because it introduces many, many unexplained mysteries, and thus runs afoul of the simplicity principle [14]. Construed as an attempt at explanation, talk of vital force is, again, mere handwaving.

In a more serious explanatory vein, there have been some efforts to fill the explanatory gap by suggesting that water can have its *structure* changed by the presence of homeopathic ingredients, and that the structure remains changed even after the sample is diluted to the point where the active ingredient is no longer present [3,10,15–17]. To fit with homeopathic theory, two further points would have to be shown:

- that the structure of the water is changed in inverse proportion to the amount of active ingredient, and that for example, when you further dilute a substance already containing either none or just a few of the molecules of the original substance, the effect is to affect the structure even more strongly;
- that the changed structure in the water can have specific and dramatic curative effects on ill bodies, but no effects on other bodies.

We will not go into details of the contemporary attempts to begin to make good on these claims, for even the proponents admit that the theory involved is 'strictly speculative' [10]. But we will note that any theory based on water 'memory' and structure will have many questions of its own to answer. For starters, as pointed out by Andrei Tokmakoff (personal communication).

(8) Everything we know about water suggests that water restructures itself within small fractions of a second (it is, after all, a liquid) and that any memory of an initial configuration is lost almost instantly. Why would things change with homeopathic preparations?

Moreover,

(9) Why would the changed structure of the water have curative properties? Why would those curative properties become enhanced by further dilution of the substance? Why would those curative properties happen to match the symptoms caused by the original ingredient when taken in higher doses?

Moreover, even with some sort of 'water memory' explanation, there would still be analogues of all the questions raised in (4) above:

(10) All samples of water will have trace amounts of impurities both natural and artificial. If infinitesimally dilute amounts of homeopathically chosen substance can structure water such that it has dramatic powers, why don't we see anything of the sort with other water samples? Or, to put it more specifically, homeopathic solutions themselves will have trace impurities beyond those of the supposedly active ingredient. How does the solution 'know' which impurities are supposed to structure it with medicinal powers?

While it is not impossible that proponents of homeopathy will arrive at a well-supported theory that answers these questions, opponents can be forgiven for being sceptical. These are large unexplained mysteries, and nothing the homeopaths have said so far comes close to providing answers.

Homeopaths sometimes point out that we do not understand the biological mechanism behind some allopathic medications, and this is true. But in such cases, we are dealing with a complex and novel chemical substance entering into a complex physiological organism. It is wholly unsurprising that the body will have *some* response, including untoward reactions leading to morbidity and even mortality, and we have seen countless cases of physiological responses to the ingestion of various natural and artificial substances. The specific mechanism may well be an unexplained mystery in some cases, but this is a very different level of mystery from those detailed above.

Second homeopathic reply: clinical effectiveness

Some proponents of homeopathy claim that the empirical evidence in favour of its effectiveness is incredibly strong – so strong that it would be foolish to discount homeopathy even if we currently have no credible idea of the mechanism [3,11]. For example, Harald Wallach writes:

> I love homeopathy – for the clinical effects I have noticed in myself, in my children, and in other people. These are sometimes so quick and strong that only the blind and the intransigent could attribute them to chance, placebo, wishful thinking, or deceit. [18]

In a number of sources [11,19], case histories are presented in which patients exhibit sudden and sometimes astounding improvements after receiving a homeopathic remedy.

Clinical experience and individual case histories certainly count as a kind of evidence. However, when examined more carefully in light of the simplicity principle, such cases typically provide much weaker evidence than it would first appear. True, it seems that the homeopath has an explanation of a particular patient's recovery and the conventional doctor does not, and thus conventional medicine must leave an additional unexplained mystery. However, it is one of the basic facts of medicine that, on average, the condition of patients seeking treatment will improve, whether treated or not. Suppose, for example, that a particular patient, call her Jane, takes a homeopathic remedy and recovers quite quickly from condition *X*; but suppose that we also know that approximately 10% of patients with *X* also exhibit a similar recovery, and that nobody knows why. So there are two questions, a particular question and a general one:

Why did Jane recover from condition *X*?

Why do 10% of patients recover in this fashion from *X*?

The homeopathic theory can answer the particular question about Jane, for the homeopath claims that the homeopathic remedy explains Jane's recovery. But conventional medicine will also have something to say in answer to the particular question: 'Jane recovered for the same reason as the approximately 10% of patients with *X* recover; Jane's case is not unique.' So both homeopathy and allopathy answer the particular question, but neither currently has an answer to the second and more general question. So, in terms of the number of unanswered questions, the homeopath and the conventional doctor are on a par. Thus, individual cases of dramatic recovery will not create new unanswered questions for conventional medicine, at least when it is known that similar recoveries occur with some frequency even in the absence of homeopathic remedies.

Of course, practitioners of homeopathy have seen more than the occasional isolated case, for they have seen hundreds or thousands of patients, and have presumably heard from many patients that their conditions improved after homeopathic treatment [20]. In accord with the simplicity principle, such results surely count as some evidence unless there is an alternate explanation for these

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results. But the problem with such unsystematically gathered evidence is that various alternate explanations seem, at least at a general level, to be available:

- patients tend, on average, to improve regardless of treatment;
- memory is unconsciously biased in favour of positive results [21,22], particularly when one considers that the entire livelihood of practitioners is on the line;
- selective reporting (e.g. patients who don't improve might be expected to forego further visits to the homeopath, and thus their negative reports will not be heard), and
- the placebo effect.

The placebo effect might be especially strong in the case of visits to homeopathic practitioners for a couple of reasons. First, judging from information gathered from websites of practitioners and other sources, initial visits to homeopathic practitioners tend to be long, detailed interviews, and second, they are costly: ranging from $150 to $500, often not covered by insurance (http://www.illinoisnaturalhealth.com/homfaq.htm; http://www.csoh.ca/Homeopathy_What_to_Expect.htm; http://www.drellenfeingold.com/aboutam.html; http://www.billgrayhomeopathy.com/Cost.html; http://www.cindeegardner.com/clinserv.htm; and [23]). The high cost could be relevant in a surprising way: Waber *et al.* found that the analgesic response to placebo pills was greater when subjects were told that the pills were more expensive [24].

Thus, from the standpoint of the simplicity principle, case series evidence and other observational studies do not provide incredibly strong evidence, for the observations made (viz., patients whose conditions improved after taking homeopathic medications) are *not* significant unexplained mysteries for the alternative theory.

Precisely because of the evidential weakness of case studies, the scientific community has long since recognized the value of randomized controlled trials (RCTs). Because of the way RCTs are structured, if the patients who received the target treatment fare significantly better than those in the control group, then this cannot be explained by regression towards the mean, biased reporting or memory, or the placebo effect. This is not to say that RCTs provide *proof* of the effectiveness of a given intervention. There might be design flaws in a particular study, leading to a false positive result; there could be reporting errors, or even outright fraud. Such factors could explain a positive result. Finally, it still might be true that a given positive result was just a chance fluke: the people who were poised to improve regardless of treatment just happened to be overrepresented in the treatment group. Citing chance in this way is tantamount to leaving the positive result as an unexplained mystery, for citing chance is really just another way of saying that we don't have an explanation. However, sometimes this can be exactly the right thing to say. Even if one were testing an utterly worthless medication against a placebo, in one out of 20 trials one would expect a result that would be expected to occur again only if the same trial was repeated 20 times, that is, one with a $P < 0.05$. Moreover, because of publication bias or the 'filedrawer effect', a large number of studies with negative results might remain unpublished, leaving only those studies which attained a positive result purely by chance. So, while citing chance is to leave a particular positive result as an unexplained mystery, it may not be leaving an incredibly large or puzzling mystery.

There have been a number of RCTs testing homeopathic remedies. Some have yielded apparently positive results, while many others have failed to show that homeopathic remedies do better than placebos. In a meta-analysis published in *Lancet* in 2005, the authors concluded that 'when analyses were restricted to large trials of higher quality there was no convincing evidence that homeopathy was superior to placebo' [25].

The *Lancet* study was controversial and was scathingly criticized in homeopathic circles [26–29]. The criticisms may have some merit. If one were proceeding merely from the clinical evidence available, it might be premature to declare, as did the editors of the *Lancet*, the 'End of Homeopathy' [30]. Critics should acknowledge that there is some weak evidence from RCTs for the effectiveness of certain homeopathic remedies. All other things being equal, one might at least advocate further study of these homeopathic interventions. However, other things are not equal. As the acceptance of homeopathy gives us enormous unexplained mysteries – (1) through (10) noted above, for example – we rightly should view the weak clinical evidence differently.

Suppose, by contrast, that there were overwhelming clinical evidence in favour of the effectiveness of homeopathy. This would give us a very confusing situation indeed. If we still denied its effectiveness, we would have the massive unexplained mystery of the positive clinical evidence. On the other hand, if we accepted the effectiveness of homeopathy, we would have the massive mysteries outlined above: how something chemically indistinguishable from water can have dramatic effects, etc. Neither stance would look remotely acceptable, and we would be well advised to have our best scientists start analysing the mechanism behind homeopathy, for we would surmise that our chemical and physiological theories must be in need of extremely substantial revision. However, we are not in this dire situation, because there is far from overwhelming clinical positive evidence for homeopathy.

Third homeopathic reply: attack on science and simplicity

Some proponents do not attempt to explain how homeopathy might work, but are also not particularly concerned with the results of controlled trials. Some would say that we do not need an explanation for the success of homeopathy because we are dealing with a phenomenon that is beyond the explanatory scope of normal western science.

However, our arguments above did not rely on canons or epistemological norms specific to western science. We relied only on the principle of simplicity, and we pointed out in section 2 that simplicity considerations underlie not only scientific discourse but also our common sense justification for rejecting such nonsense as the 5-minute theory of the world. Thus the simplicity principle is common ground. It is not a parochial expression of a conventional, western approach to science and medicine; rather it is deeply engrained in common sense, and is implicitly accepted by all participants in the homeopathy debate.

In fact, even apart from arguments about Aristotelian physics or the 5-minute theory, proponents of homeopathy implicitly commit themselves to (S) or something like it. Recall that homeopaths believe that homeopathy works primarily because they claim to have observed its success in practice. But it is important to see that such experience counts as evidence precisely because we accept the simplicity principle. As we saw above, homeopaths present cases in which a patient was given a homeopathic remedy, and the patient's condition then improved. The homeopath claims to have

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a theory which *explains* this occurrence, namely that the homeopathic remedy made the patient better. There is then a challenge for the sceptic: 'on your alternative theory, on which homeopathic remedies have no effect, you must leave this event as an unexplained mystery; so, all else being equal, my theory explains more than yours'. Only because of some such explanatory challenge does the anecdotal evidence mean anything at all. Of course, as we argued above, the homeopath's explanatory challenge can be met, but the point here is that homeopaths can claim that positive clinical experience as evidence for homeopathy only because they themselves accept something like the simplicity principle. So if the homeopath then rejects the principle when confronted with questions like (1) to (10) above, this would be simple hypocrisy.

Conclusion

The situation is this: those who deny the effectiveness of homeopathy do have some unexplained mysteries – namely the handful of positive results from RCTs and the weaker evidence consisting of anecdotal and observational reports from practitioners and consumers alike; on the other hand, those who claim that homeopathy is effective have enormous unexplained mysteries, and answering those mysteries would appear to require massive revision of standard chemistry and physiology. As with all scientific questions, it is one of balance and evidence rather than proof. Given the weakness of the clinical evidence, and given the vast mysteries imposed upon us by the acceptance of homeopathy, the balance is heavily against homeopathy, and this is not a matter of intransigence or blind faith in an allopathic paradigm.

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